

What is claimed is:

1. A system for preparing a mixture of water and at least one non-aqueous material, comprising:

a mixing zone;

means for injecting water into the mixing zone;

means for injecting the at least one non-aqueous material into the mixing zone; and

a sensor disposed within the mixing zone that measures the concentration of water in the mixture.

2. The system for preparing a mixture according to claim 1, wherein the mixing zone comprises a mixing tub.

3. The system for preparing a mixture according to claim 2, wherein the sensor is disposed within the mixing tub.

4. The system for preparing a mixture according to claim 2, wherein the mixing zone further comprises a recirculation circuit.

5. The system for preparing a mixture according to claim 4, wherein the sensor is disposed within the recirculation circuit.

6. The system for preparing a mixture according to claim 1, wherein the injecting means further comprise a mixing head into which the water and at least one non-aqueous material are injected prior to being injected into the mixing zone and a flow line having a valve disposed therein that injects the water into the mixing head and a flow line having a valve disposed therein that injects the at least one non-aqueous material into the mixing head.

7. The system for preparing a mixture according to claim 6, wherein each of the valves is manually controlled.

8. The system for preparing a mixture according to claim 6, wherein each of the valves is controlled by an automatic controller, which is connected to the water concentration sensor.

9. The system for preparing a mixture according to claim 8, wherein each of the valves comprises an actuator connected to the automatic controller.

10. The system for preparing a mixture according to claim 9, further comprising a flow rate sensor disposed within the water flow line and wherein the flow rate sensor is connected to the automatic controller.

11. The system for preparing a mixture according to claim 9, wherein the automatic controller controls one or more of the actuators on the valves in response to signals received from the water concentration sensor.

12. The system for preparing a mixture according to claim 10, wherein the automatic controller controls one or more of the actuators on the valves in response to signals received from the water concentration sensor and the flow rate sensor.

13. The system for preparing a mixture according to claim 8, wherein the automatic controller comprises a computer.

14. The system for preparing a mixture according to claim 2, wherein the mixing tub comprises two compartments separated by a weir.

15. The system for preparing a mixture according to claim 14, further comprising an agitator in each of the compartments that mixes the water and at least one non-aqueous material.

16. The system for preparing a mixture according to claim 4, wherein the recirculation circuit comprises a centrifugal pump.

17. The system for preparing a mixture according to claim 4, wherein the recirculation circuit further comprises a densometer, which measures the density of the mixture flowing through the recirculation circuit.

18. A system for preparing a mixture of water and at least one non-aqueous material comprising:

    a mixing zone;  
    means for injecting water into the mixing zone;  
    means for injecting the at least one non-aqueous material into the mixing zone;  
    a flow line through which the mixture is discharged from the mixing zone; and  
    a sensor disposed within the discharge flow line that measures the concentration of water in the mixture.

19. The system for preparing a mixture according to claim 18, wherein the mixing zone comprises a mixing tub.

20. The system for preparing a mixture according to claim 19, wherein the mixing zone further comprises a recirculation circuit.

21. The system for preparing a mixture according to claim 18, wherein the injecting means further comprise a mixing head into which the water and at least one non-aqueous material are injected prior to being injected into the mixing zone and a flow line having a valve disposed therein that injects the water into the mixing head and a flow line having a valve disposed therein that injects the at least one non-aqueous material into the mixing head.

22. The system for preparing a mixture according to claim 21, wherein each of the valves is manually controlled.

23. The system for preparing a mixture according to claim 21, wherein each of the valves is controlled by an automatic controller, which is connected to the water concentration sensor.

24. The system for preparing a mixture according to claim 23, wherein each of the valves comprises an actuator connected to the automatic controller.

25. The system for preparing a mixture according to claim 24, further comprising a flow rate sensor disposed within the water flow line and wherein the flow rate sensor is connected to the automatic controller.

26. The system for preparing a mixture according to claim 24, wherein the automatic controller controls one or more of the actuators on the valves in response to signals received from the water concentration sensor.

27. The system for preparing a mixture according to claim 25, wherein the automatic controller controls one or more of the actuators on the valves in response to signals received from the water concentration sensor and the flow rate sensor.

28. The system for preparing a mixture according to claim 23, wherein the automatic controller comprises a computer.

29. The system for preparing a mixture according to claim 19, wherein the mixing tub comprises two compartments separated by a weir.

30. The system for preparing a mixture according to claim 29, further comprising an agitator in each of the compartments that mixes the fluid.

31. The system for preparing a mixture according to claim 20, wherein the recirculation circuit comprises a centrifugal pump.

32. The system for preparing a mixture according to claim 20, wherein the recirculation circuit further comprises a densometer, which measures the density of the mixture flowing through the recirculation circuit.

33. A method for preparing a mixture comprising water and at least one non-aqueous material, comprising the steps of:

combining the water and at least one non-aqueous material in a mixing zone;

measuring the concentration of water in the mixture; and

adjusting the amount of water and/or at least one non-aqueous material being combined in the mixing zone so as to obtain a desired water/non-aqueous material concentration.

34. The method for preparing a mixture according to claim 33, further comprising the step of discharging the mixture from the mixing zone.

35. The method for preparing a mixture according to claim 33, further comprising the step of adjusting the amount of water and/or the at least one non-aqueous material being injected into the mixing zone if the concentration of water in the mixture is not at a desired level.

36. The method for preparing a mixture according to claim 35 wherein the adjusting step is performed by actuating one or more valves in flow lines through which the water and at least one non-aqueous material are injected into a mixing head, which in turn injects the water and at least one non-aqueous material into the mixing zone.

37. The method for preparing a mixture according to claim 36, wherein the actuating step is performed by an automatic controller comprising a computer, which is connected to the valves in the flow lines and a sensor that measures the concentration of water.

38. The method for preparing a mixture according to claim 38, further comprising the step of sensing the flow rate of the water being injected into the mixing head using a flow rate sensor disposed within the water flow line.

39. The method for preparing a mixture according to claim 36, further comprising the step of transmitting flow rate data from the flow rate sensor to the automatic controller.

40. The method for preparing a mixture according to claim 33, further comprising the step of mixing the water and at least one non-aqueous material in a mixing tub.

41. The method for preparing a mixture according to claim 33, further comprising the step of measuring the density of the mixture.

42. The method for preparing a mixture according to claim 33, wherein the concentration of water in the mixture is measured in the mixing zone.

43. The method for preparing a mixture according to claim 34, wherein the concentration of water in the mixture is measured as the mixture is being discharged from the mixing zone.

44. The method for preparing a mixture according to claim 33, wherein the non-aqueous material comprises cement.